THE AMERICAN MINERALOGIST

VOL. II AUGUST, 1917 No. 8

A MINERALOGICAL PILGRIMAGE THRU CONNECTICUT

CHARLES W. HOADLEY

Englewood, N. J.

It has been suggested to me by one of my friends, a member of the New York Mineralogical Club, to give a brief account of a recent trip thru Connecticut. Leaving Englewood by motor, my companion and I crossed the Hudson River on the historic ferry boat "Rockland" at Nyack, N. Y., and jogged slowly thru Westchester County on back roads, passing Bedford and Mount Kisco, to Ridgefield, Conn., at which charming spot we had lunch. After the inner-man was duly resuscitated, the Branchville locality, about four miles from Ridgefield, was visited.

I would hardly advise the collector to spend much time in the Branchville quarry. In an old edition of Dana the following rare minerals are mentioned as having been found there: native bismuth, eucryptite, fairfieldite, dickinsonite, reddingite, etc. Many of these minerals are more or less vague, and would naturally have to be determined by analysis; I question very much whether any of them are to be found at the present time. The usual minerals which are found in the typical spar quarries of New England were present: muscovite, biotite, quartz, albite; but neither tourmaline nor beryl could be found. It appears to be an extinct locality as far as interesting minerals are concerned.

After a night spent at Danbury, the following day was given up entirely to a thoro appreciation of the wonderful New England countryside south of Litchfield, which was our next stopping place. In the afternoon we traversed more beautiful country, with exquisite examples of colonial architecture at short intervals. Six o'clock in the afternoon brought us to the historic Bristol locality, near Farmington, Conn. At Bristol we succeeded in collecting good specimens of chalcopyrite, malachite and chalcocite. The mine, as it should technically be called, has not been worked for a number of years, but the material in the dumps is now being made use of for road-metal.

Farmington, Conn., is famous for its remarkable colonial houses. Its main street, running north and south for a distance of over a mile, is bordered on either side with houses, most of which have been built for over 100 years. It would be difficult to give any accurate impression of this lovely place; in a great many ways it is unique. It is a town which is worth visiting to the architect perhaps more than to the mineralogist.

Running north and south parallel to the main street of the town is a ridge of trap rock which follows the Connecticut River from Plainville, extending for a distance of 25 miles or so. This is, no doubt, a continuation of the trap rock outcrop which occurs further south, near New Haven, forming East and West rock. The usual zeolites are found in Farmington, but not in any great quantity.

Our next stopping place was on the other side of the Connecticut River near Middletown, three miles or so east of Portland. This is a spar quarry, where we acquired with little difficulty good specimens of albite in large crystals somewhat similar to the Amelia Court House material, quartz coated with byssolite, tourmaline, beryl, and large plates of biotite. For lunch we traveled across the river to Middletown, where we feasted on fresh shad caught that morning from the river, in one of the most delightful of inns.

The afternoon was spent to a great extent in traveling up and down hills, wasting gasoline, in the attempt to find the famous Gillette quarry, said to be located directly on the river near Rock Landing, Haddam Neck. Be sure to note the "Neck". As far as I know there are half a dozen different Haddams: Little Haddam, East Haddam, Middle Haddam, and so on. The collector who is in search of tourmalines from Haddam Neck should be sure to inquire particularly for the Gillette quarry, south of Rock Landing, on the east bank of the Connecticut River. At Haddam Neck the quarry is not being worked, nevertheless I succeeded in getting good specimens of tourmaline, distorted quartz crystals and apatite.

As we were working our way south, with Saybrook as our destination (the roads on the east side of the river below Haddam being very bad) we decided to cross the river again to the west bank at Godspeed and Modus, arriving at Saybrook in time for a very much appreciated dinner. The following day, passing through New Haven, we visited the tungsten mine in the township of Trumbull, near the Long Hill Railroad Station, 15 miles north of Bridgeport. In the course of an hour's time good specimens of scheelite, bornite, fibrous amphibole, topaz, siderite and chalcopyrite were procured from a very tough schist rock. The mill was recently destroyed by fire. The locality is accessible from Bridgeport by trolley, which runs to within half a mile of the mine. There is a good deal of material to be acquired from the dumps, much of it fresh and of considerable interest.

From Bridgeport we returned to Englewood direct, without further incident.

DEVELOPING CRYSTALLIZED MINERAL SPECIMENS

ALFRED C. HAWKINS

Bartlesville, Okla.

Among the most attractive and highly prized specimens in any collection are the crystallized ones. The most valuable crystal is usually the one which is attached to the matrix in a manner which by suitable contrast of color and form serves to show forth its beauty and symmetry to the greatest possible degree. We naturally prefer also that the crystal should never have been removed from this matrix, nor artificially attached to either its natural matrix, or, (as sometimes occurs), to a kind of rock or mineral aggregate where it never belonged.

While it is true that an occasional specimen in which the crystals are imbedded in a solid matrix will break at the time of original collecting in such a way as to expose the crystals to the best advantage, yet probably the best of such matrix specimens seen in our collections have been "developed" to some extent. Crystallized material of this type is often put upon the market in the crude form in which it was obtained from the quarry. In such cases the wise purchaser will have ample opportunity to increase the beauty of appearance, as well as the value, of his "finds."

There are two principal ways of removing the superfluous matrix which surrounds and covers the crystals; the first is by solution, the second by cutting it out with tools. Regarding the use of either of these methods a few words of caution are necessary. The method of attack will vary with the nature of the matrix.

Dilute hydrochloric or nitric acid is used in the solution process. Limestone matrix is easily removed in this way; it goes into solution quickly and the only requirement for continued action is the addition of fresh acid when necessary. Other less common matrix materials may be treated in a similar way, but react differently; as, for instance, the natrolite surrounding the benitoite and neptunite crystals from California, which, during treatment with acid, forms a thick, insoluble jelly. This colloidal substance collects in a layer which protects the surface of the mineral below; it must be scraped off at intervals before fresh acid is applied. Above all things else it is necessary when treating specimens with acid, to make sure that the crystals which are to be brought into relief are not themselves attacked by the solvent, which would result in the destruction of the luster of crystal faces or of the solid angles of the crystals. Many Franklin Furnace specimens have been permanently ruined in this way. Careful reference to a standard textbook on mineralogy will determine this important point in advance. After treatment with acid, specimens should be soaked for some time in water, preferably warm, providing, of course, that the crystals are insoluble in water, or in a weak ammonia solution, to remove and neutralize all traces of acid which may be left. Acid remaining gives a yellow color, acidic odor, and corrosive action on labels and trays.

For removal of matrix which is not attacked by acids, small steel chisels or pointed instruments are used. The writer has used straight sail-needles, whose points were renewed at intervals on a grind-stone. In the use of pointed instruments, extreme care and patience are necessary, as a single slip may damage a valuable crystal beyond repair. The chisel should be held firmly and the hand braced against the specimen or its support. Perhaps the greatest danger of injury to the crystal occurs when the surrounding material suddenly breaks away under the blows of the hammer, exposing the crystal face just beneath. In working away the matrix close to a crystal, the direction of the blows should always be away from it. This avoids bruising of crystal faces. The hammer itself should be light in weight, with a flat face, preferably square. The handle should be of wood, long and flexible. The blows should usually be short, sharp taps, causing the least possible jar to the specimen. It will be found that when excessive jar occurs, the most severe breakage is likely to be on the side of the specimen farthest from the point where the blow was delivered, as the stresses are transmitted thru the specimen to that point. The specimen can be supported in some way to deaden the jar—in a box of sand, or upon a cloth bag filled with sand. The matrix should be removed slowly, grain by grain, if granular. Thus the quartz of pegmatite veins is easily removed when it is granular, especially when somewhat shattered by quarrying operations. Other kinds of matrix, like the sericite schist in the cyanite-staurolite specimens of Switzerland will separate in thin flakes. Care should always be taken to remove as little as possible at a time. Very hard materials, like massive or crystalline natrolite, can sometimes be first attacked with acid and then removed with the chisel.

It must be remembered that the average crystal in a matrix like a limestone or a pegmatite vein has no natural cement attaching it to its matrix; it simply lies in a smooth cavity whose walls correspond to its crystal faces. Hence enough matrix should be left surrounding the crystal to hold it firmly in its place.

Crystals imbedded in solid vein material (especially in veins or dikes in metamorphic rocks), will occasionally be found to be naturally shattered by earth movements into many small pieces, some of which fall away when the crystal is exposed. This is true, for instance, of some garnets, tourmalines, and apatites from New York City. In other cases, portions of brittle crystals may be chipped off with the matrix, to which portions, especially the solid angles, sometimes adhere. In case breakage of crystals occurs, it is frequently possible to repair them, filling any small cracks with a paste made of small fragments of crystals of the same kind and color, mixed with glue.

THE COLORADO STATE BUREAU OF MINES COLLECTION

J. TERRY DUCE

Denver, Colorado

The collection at the State Bureau of Mines in Denver presents, in rather typical form, some of the problems which come up in the relationship of technology to science. The collection originated thru the efforts of the various Exposition Commissions, and has since been in the care of the Bureau. Part of the material was purchased, however, from Dr. Elsner, an old Denver collector. As the position of Commissioner of Mines was a political appointment the collection has enjoyed for many years the vicissitudes of state politics. At times some very able men had charge of it, and at others it was allowed to go to rack and ruin.

With the advent of the new Commissioner of Mines, a more enlightened policy was adopted. As a first measure, all specimens were moved from the dark gloomy basement of the State Capitol and placed on the second floor in the State Museum Building. In the second place it was decided to radically change the system of arrangement. No complete catalogs of the material existed, the only key to a specimen being the block upon which it rested and it was a frequent occurrence to find a specimen on a block to which it showed no relationship whatever; for instance, a pyrite crystal on a block marked calcite.

Cataloging was begun immediately after the collection was moved, the specimens being numbered consecutively and listed individually. To each specimen a card was allowed and on it the following data was recorded:

1. The number of the specimen
2. The names of the mineral species present
3. The type of ore which the specimen represents
4. Any analysis
5. The locality
6. The donor

The index cards were of two classes: systematic cards and mineral resource cards. The difference between these will be more apparent when the discussion of the arrangement is taken up. On the systematic cards however, the name of the mineral species for which the specimen was exhibited was underlined in red ink, and the formula and percentage composition of that mineral given.

Sample cards are shown on the following page.

These cards have been cross-indexed for species, ores, mines, localities and donors, so that any information concerning a specimen can be found almost instantly.

The reason for the dual arrangement becomes apparent when the exigencies of the case are considered. In the first place, much of the material consists of ore specimens which are exceedingly complex in mineralogical composition; secondly, the fact that the collection is also used to illustrate the mineral resources of the State has rendered desirable the inclusion of material that the mineralogist would instantly reject as not good enough for exhibition. These considerations lead to a dual grouping, a mineral resources series grouped according to locality and a systematic series grouped partially according to economic use and partially according to Dana. All the rock minerals are grouped systematically, while the ores are arranged according to their economic use. Into the first of these two groups all typical mineralogical specimens are diverted, other material going into the mineral resource cases.

As the collection stands at present, it comprises about 20,000 specimens and is exceedingly rich in Colorado ores, particularly the tellurides, the tetrahedrite-tennantite group, enargite and certain silver minerals, such as cerargyrite, embolite and pyrargyrite. The collections of zeolites from Golden and of microcline and smoky quartz from the Crystal Peak District of Teller County are important, as are also the numerous specimens of uranium, tungsten and molybdenum ores.

About three hundred mineral species are included in the catalog, besides many rocks. Taking the volume of minerals into consideration, the writer believes this is by far the largest mineral collection in the Rocky Mountain region. It is proposed to push field work energetically this summer and to build up, if possible, an exchange list with other institutions and individuals. This should not prove difficult because of the relative abundance of a number of rare minerals within the borders of the state of Colorado.

SAMPLE SYSTEMATIC CARD

6768 **CALCITE** (White) Dana 270
On Limonite (Brown)
Calcium Carbonate
$CaCO_3$
Case
17E
Lime, CaO 56.0%
Carbon dioxide, CO_2 .... 44.0%
Robert E. Lee Mine, Lake County,
Colorado
Donor, John G. Morgan.

SAMPLE MINERAL RESOURCE CARD

3248 Gold-Silver Ore
Auriferous Pyrite (brassy) with wire silver (dark filaments) in chert breccia.
Case Gold 15 oz. per ton
3N Silver 1000 oz. per ton
Ground Hog Mine, Eagle County,
Colorado.
Donor, W. E. Rennie.

THE OCCURRENCE OF THE NATIVE ELEMENTS

EDGAR T. WHERRY

U. S. National Museum

Native elements are defined as those existing in nature in the free state, not chemically combined with other elements, altho in many cases more or less admixed with others. A list of them was published in the initial number of this magazine.[1] Some elements are almost always found native, others only exceptionally so, while about half of the elements known to chemists have been observed only in compounds with one another. What are the reasons for these relations?

Just as in biology, certain features of organisms are connected with heredity and others with environment, so here we find both inherent properties and external circumstances concerned in the determination of whether an element can exist in the native state or not. Of the inherent properties the chief one is chemical affinity, the influence which leads elements to enter into chemical compounds. The principal external circumstance is the fact that the element oxygen is present in the earth in great abundance, amounting, it is calculated, to 50% of the whole. Let us consider the manner in which these causes cooperate to produce the relations observed.

It will be most convenient to take up the elements in the groups represented by the vertical columns of the Periodic System[2], since the elements in these groups show similarities which enable the occurrence of several to be discussed at the same time. For the sake of completeness gaseous elements will be included, altho they are not usually regarded as minerals.

The first column contains but one element, hydrogen. Hydrogen is a gas which possesses considerable affinity for oxygen and other non-metallic elements. It therefore occurs in the earth mostly in compounds, but as its compounds are decomposed at temperatures such as exist in igneous magmas, it is given off by volcanoes. If it escapes in a heated condition it burns in the oxygen of the air to form steam, but if cooled before coming into contact with the air it may remain in the free state, for it does not unite with oxygen when cold. A minute amount appears to be normally present in the atmosphere.

The six gases of the second column, helium, neon, argon, krypton, xenon and niton, are peculiar in that they show practically no chemical affinity, no definite compounds of them with other elements having been prepared. They therefore exist normally in the free state, and they make up about one per cent by volume of the earth's atmosphere. Helium is also found in certain radioactive minerals, such as uraninite, being one of the end-products of the disintegration of the radioactive elements; while niton, also known as radium-emanation, is given off as an intermediate stage in this disintegration.

---

[1] *Am. Min.* **1**, (1), 8, 1916.

[2] *Am. Min.* **1**, (1), 7, 1916.

The elements of the third column, known as the alkali metals, possess great affinity for oxygen and other elements, and are incapable of existing in the air or in the rocks for any length of time without turning into oxides. Two of them, sodium and potassium (Na and K) have, nevertheless, been shown to occur free in nature in the peculiar condition known as the dispersoid state. When the radiations given out by radium or other radioactive elements act upon certain compounds slight decomposition occurs, and the component elements are set free, becoming disseminated thru the unchanged substance as submicroscopic particles. In the case of the mineral halite, which is chemically sodium chloride, the particles of sodium thus liberated cause the mineral to assume a blue color. Specimens of such blue halite, as well as of the corresponding potassium compound sylvite, have long been known to mineral collectors, but the explanation of the color has been shown to lie in the presence of minute amounts of the respective metals in this "dispersoid" condition only in the most recent years.[3]

Copper, silver and gold (Cu, Ag and Au), the metals constituting the fourth column, exhibit comparatively slight chemical affinity, especially toward oxygen, this decreasing in the order named. They are readily set free from their compounds, and once in this condition, are likely to remain so. They accordingly are frequently found in the native state, gold being, indeed, almost unknown in any other form.

In the next column, that of alkaline earths, chemical affinity is again marked, and only one member, calcium, has been reported to occur native, in the dispersoid state, as the coloring matter of certain specimens of the mineral fluorite[4]; its existence can not as yet be regarded as proved.

Two members of the sixth column, zinc and mercury, have been observed native, altho the chemical activity of the former is so great that its occurrence is rather unexpected, and has indeed been questioned. Mercury, however, is comparatively inactive, not uniting with oxygen in the cold, and is often found free in cavities in its ores.

No members of the seventh or eighth columns appear to occur in the native state, for their chemical activity is extreme, but in the ninth column the first, (and possibly the second), element has been so found. Carbon is an element which possesses strong affinity for oxygen, but requires heating to high temperatures for direct union to take place; once liberated from its compounds therefore, it is fairly stable. Its liberation is believed to have been accomplished in most cases by the action of heat and pressure on its compounds with hydrogen. Silicon is, on the other hand, liberated from its compounds only with great difficulty, and would not be exepcted to occur native under ordinary circumstances. It has merely been suggested to be the cause of color of smoky quartz, in which it may exist in dispersoid condition.[5]

---

[3] Professor E. Goldstein, *Nature*, **94**, 494, 1914.

[4] Professor C. Doelter, *Sitzb. Akad. Wiss. Wien*, **1908**, 1312.

In the ninth column germanium is extremely rare, but tin and lead (Sn and Pb) are well known metals, oxidized somewhat readily in the air, yet reduced from their compounds without difficulty. Tin has been reported as occurring native in many deposits of its oxide, and altho some of these reports are no doubt erroneous, it seems probable that native tin does at times occur. Lead is found in fissures in connection with ores in which sulfur is deficient.

All of the five members of the tenth column have been reported to occur native. Nitrogen, a gas, is abundant in the atmosphere in the free state, since it unites with oxygen only under such exceptional conditions as the presence of an intense electrical discharge. Phosphorus, on the other hand, is highly active chemically and unites with oxygen with such violence that its occurence in minerals in the free state is decidedly unexpected. It has been reported to exist in a stony meteorite[6], (containing 8% of metallic iron) but this seems highly improbable, as it unites with iron directly, to form the iron phosphide schreibersite. Perhaps the phosphorus observed was temporarily set free either by the actual drilling operation or by local decomposition of iron phosphide in the presence of a limited amount of air. Its occurrence in the dispersoid form in phosphate rocks has been reported also. Arsenic, antimony and bismuth, the remaining members, are less active than phosphorus, and altho they unite with oxygen, can be readily reduced again. All three are well known to occur native in connection with deposits of other minerals containing them.

Coming to the eleventh column, vanadium is an element with strong affinity for oxygen, which accordingly does not occur free in ordinary rocks; but it is found to a slight extent in meteorites, which have formed in the presence of limited amounts of oxygen; even here it is not in the pure state, but is alloyed with a large excess of iron, and can only be detected by analysis. Columbium and tantalum are rare elements which also unite readily with oxygen and are reduced from compounds with difficulty. Nevertheless an alloy of the two has been discovered in certain gold-washings in Asia, and is sold by mineral dealers under the name of native tantalum.

The elements of the twelfth column are again all found native. Oxygen, altho it unites with most other elements, is present in the air in large amount. Sulfur, selenium, and tellurium have considerable affinity for oxygen, but where reducing action can take place in the presence of an insufficient amount of air they may be set free, and once in this form do not unite with oxygen unless heated. They are also given off in the gaseous form from volcanoes.

---

[5] Koenigsberger and Müller, *Centr. Min. Geol.* **1906**, 73, note.

[6] Dr. O. C. Farrington, *Am. J. Sci.*, **15**, 71, 1903.

The metals of the thirteenth column form oxides which are decomposed only with difficulty, and none of them have been observed native in terrestrial rocks. Chromium is shown by analysis to occur alloyed with the iron of some meteorites.

The halogen elements, which appear in the fifteenth column, have little affinity for oxygen, but unite readily with metallic substances. It is therefore surprising that any of them should be found free in nature, yet they all have been reported. Certain varieties of the mineral fluorite, a compound of calcium with fluorine, contain in minute cracks traces of free fluorine gas, which has probably been liberated by radioactive processes. Chlorine, another gaseous element, is liberated from its compounds by radioactivity also, but is better known in volcanic emanations, where it is formed by complex reactions in the magma. Bromine, which may be either a liquid or a gas at ordinary temperatures, has been reported to occur free by Professor Vernadsky[7]; while iodine, in solid colloidal form, according to the same authority was reported as early as 1877. The last two are, however, of doubtful authenticity.

The single element of the sixteenth column, manganese, is a metal possessing such strong affinity for oxygen and other elements that it could not exist in the free state in the earth for any length of time; alloyed with iron, however, it is protected from attack, and it has been observed to be present in both terrestrial and meteoric irons, tho in relatively small amount.

The metals of the last column show a gradual decrease in chemical activity downward, iron uniting readily with oxygen, while platinum does not unite directly with it, except at high temperature. Iron is, however, readily reduced from its compounds by carbon, and occurs native where opportunity for such reduction has been offered, and where the resulting metal has not been exposed to the action of moist air for any length of time; it is also present in practically all meteorites, which have evidently formed under conditions where oxygen was limited in amount. Cobalt and nickel are found alloyed with iron, and the nickel sometimes exceeds the iron in amount. The remaining six metals occur more or less alloyed together, or alloyed with iron and nickel. They are comparatively resistant to oxidation and are rarely found in other than the metallic state.

Over half of the known chemical elements have thus been reported to occur in the native state.[8]

---

[7] *Opuit Opisatel'noi Mineralogii* (*Descriptive Mineralogy*, Russian) **1**, 1908.

[8] A discussion of the nomenclature and classification of the native element minerals will appear in a forthcoming number of the Journal of the Washington Academy of Sciences.

AN ELEMENTARY INTRODUCTION TO CRYSTALLOGRAPHY

J. P. WINTRINGHAM

Brooklyn, N. Y.

(*Continued from page 94*)

There are two more forms with twenty-four faces. These are best called the trigonal (three-edged) tris-(three-faced) octahedron and the tetragonal (four-edged), tris- (three-faced) octahedron. They both have a three-faced pyramid on each face of the octahedron. To develop them draw a triangle with equal sides and one corner at the top. This will represent one face of the octahedron. The top corner will be the end of the *c* axis, that to the left *a*, and that to the right *b*.

It is only necessary to remember that the larger symbol means further away from the ends of the axes. Take 221; this indicates that the *a* and *b* axes are cut half way in, towards the center, where the axes cross each other, while the *c* axis is cut at its end. The lower edge of our triangle is a line between the ends of the *a* and *b* axes.

If the points indicated by 2, 2 on these axes should be joined by a line, such a line would be parallel to the edge of the triangle or of the octahedron. The face indicated by 221 would thus be tipped down equally on the *a* and *b* axes and up on the *c* axis. The other two faces, 212 and 122 would be similarly placed. The three faces would build a little pyramid on a face 222. This face 222 is exactly parallel to 111, and can in fact not be distinguished from 111.

If in the center of our triangle we put a dot and join it to the three angles or tips it represents one face of the octahedron with its three sided pyramid, each side having three edges. With the other faces of the octahedron treated in the same way we would have our trigonal trisoctahedron of twenty-four faces.

(111) in brackets means all the eight faces of an octahedron, while 111 means the upper, right hand, forward face. The portion of a crystal in this direction is often called a quadrant, or, more properly, an octant. Note that this octant has all three symbols without a dash. This is generally true of any face in this octant. To reverse the sign by putting in dashes where there are none, and leaving them out where there are, indicates a face directly opposite a given face.

(221) and (211) are the symbols of two crystal forms that have twenty-four faces each. As each of them can only be varied by changing the position of the odd number, 1 in 221 and 2 in 211, it is evident there can be only three of these faces in each octant. The idea we can get of them from the symbol is the direction and the amount of the slant.

The four-faced cube (210) has edges at the base of the pyramid identical with the edges of the cube. The three-faced octahedron (221) has edges at the base of the pyramid identical with the edges of the octahedron.

The planes that make these faces cut two axes equally near the center and the third axis further out, or at the end.

(*To be continued*)

PROCEEDINGS OF SOCIETIES

THE PHILADELPHIA MINERALOGICAL SOCIETY

Wagner Free Institute of Science, June 14, 1917.

The President, Mr. Trudell, in the chair. Eleven members and four visitors present. Mr. Frederick Oldach, proposed by Mr. Gordon, was elected to active membership.

Mr. Samuel G. Gordon gave a brief talk, illustrated with lantern slides, on "Some Philadelphia Mineral Collections."

Mr. Oldach reported the results of the Society's trip to Mineral Hill on May 6th. Chromite and anthophyllite were found at Moro Phillips' chrome mine, on Battles' farm. At Mineral Hill a little sunstone, moonstone, amazonstone, and deweylite were obtained.

The Secretary reported the trip to the Frankford localities on May 19th. The stilbite locality, now being filled with rubbish, looked uninviting and was not entered. This quarry is situated at Church and Leiper Sts., opposite the site of the molybdenite locality, which has been built over. Clark's quarry has again been abandoned, and is filled with water. It is doubtful if it will ever be reopened. At O'Neill's quarry the following were noted: orthoclase, hornblende, epidote, wernerite (?), biotite, vermiculite, stilbite, titanite and apatite.

The trip to Unionville on Decoration Day was reported by Mr. Knabe. At the corundum mines the following are obtainable: corundum, albite, tourmaline, margarite, and green quartz; at Beryl Hill: indifferent pieces of beryl, muscovite and microcline; at the Poorhouse Quarry, not at present being worked: quartz, calcite, dolomite and chesterlite (microcline).

The secretary reported the trip to the West Philadelphia localities on June 9th. At 64th and Lansdowne Ave. a hill is being leveled and the gneiss contains large cleavages of orthoclase showing Carlsbad twinning. Poor specimens of hyalite were obtained. A small quartz crystal was found at the Overbrook locality, back of the Blind Asylum.

In view of the fact that collectors may be thinking of visiting Franklin during the summer, the secretary told of some of the conditions there. The mines are carefully guarded by a dozen detectives, and permission to visit the mines and even the dumps is very difficult, if not impossible to obtain. In fact all visitors are followed by these men, and if a collector does pick up a specimen from one of the dumps, he is forced to put it back.

An amendment to the constitution was made extending the limit of the president's term to three successive years.

FIELD EXCURSION

SATURDAY, SUNDAY AND MONDAY (LABOR DAY) Sept. 1–3. Falls of French Creek. Meet at 69th St. Terminal at 1.15 P. M., Saturday.

STATED MEETING

Thursday, September 13, 1917 8 P. M.

Reports of trips to Frankford, Lafayette, Leiperville, Friedensville, Perkiomen and the Falls of French Creek, by Messrs. Oldach, Gordon, Warford and Trudell.

Illustrated with specimens and lantern slides.

SAMUEL G. GORDON, *Secretary*.

NEW MINERALS

Eakleite

Eakleite, a new mineral from California. E. S. Larsen, U.S. Geol. Survey. *Am. J. Sci.* [4], **43**, (6), 464-465, 1917.

Name: after Prof. Arthur S. Eakle, University of California. Pronounced ak-el-ite.

Physical and Optical Properties

Color: pale pink; luster: vitreous to silky. Form: compact, tough layers of fibers. H: about 6½. Sp. Gr. 2.685-2.705. The fibers give parallel extinction, and are elongated parallel to Z. Optically +, with a small axial angle. Refractive indices: α and $\beta = 1.583$, $\gamma = 1.593$, all ± 0.001.

Chemical Properties

Composition: $5CaO.5SiO_2.H_2O$. It may be a calcium-pectolite. Analysis by Prof. Eakle gave: SiO_2, 50.43; Fe_2O_3, 0.98; CaO, 45.51; MgO tr., Na_2O and K_2O none, H_2O, 3.25, sum 100.17.

Fuses at about 2.5 with slight boiling to a glassy, somewhat vesicular globule: easily soluble in acid with separation of flaky silica without gelatinization.

Found in the Museum of the University of California, labeled "Wollastonite, St. Inez, Calif." S. G. G.

Gilpinite

Gilpinite, a new uranium mineral from Colorado. Esper S. Larsen and Glenn V. Brown. *American Mineralogist*, **2**, (6), 75–79, 1917.

ABSTRACTS OF MINERALOGICAL LITERATURE

ANALYSES OF WESTERN AUSTRALIA ROCKS, METEORITES AND NATURAL WATERS. Edward S. Simpson, Geological Survey, Western Australia; *Bull*, **67**, 196 pp., 10 pl., 1916.

NOTE ON GOYAZITE. Oliver C. Farrington. *Am. J. Sci.*, [4], **43**, (5), 420, 1917. Reply to Schaller (see *Am. Min.*, **2**, (5), 70, 1917). Dr. Farrington points out the difference in the P_2O_5 percentage of goyazite and hamlinite, and concludes that their identity has not yet been proved.

W. G. L.

NEW MINERAL NAMES [Third List]. W. E. Ford, Yale University. *Am. J. Sci.*, [4], **43**, (6), 493-494, 1917.

A descriptive alfabetical list of six new mineral names which have appeared in the literature since the publication of the previous list (December, 1916). All have been noted in *Am. Min.* S. G. G.

NOTES ON THE WHITFIELD COUNTY, GEORGIA, METEORIC IRONS, WITH NEW ANALYSES. George P. Merrill. *Proc. U. S Nat. Mus.*, **51**, 447-449, 1916.

An examination of the *Whitfield County* iron of Hidden and the *Dalton* iron of Shepard showed the two to differ radically in their structure and etching peculiarities altho there is a close chemical resemblance, and it is believed that they represent two distinct falls. The identity of the *Dalton* iron and the *Cleveland* iron, as suggested by Kunz, is also questioned, the *Dalton* iron lacking the Reichenbach figures, and differing further in chemical composition. S. G. G.

THE THEORETICAL NUMBER OF ORTHO-AXIAL PLAGIOCLASES. G. Cesaro. *Bull. soc. franc. min.* **39**, 95–148, 1916.

A TITANIFEROUS AUGITE FROM ICE RIVER, BRITISH COLUMBIA. C. H. WARREN, JOHN A. ALLAN; analysis by M. F. CONNER. *Am. J. Sci.* [4], **43**, (1), 75-78, 1917.

The augite occurs in a nepheline-syenite; associated with brown barkevikitic hornblende, biotite, nephelite, apatite, titanite, and ilmenite. Analysis by M. F. C. gave: SiO_2, 41.80; Al_2O_3, 9.30; Fe_2O_3, 5.44; FeO, 3.30; MgO, 10.82; CaO, 22.89; H_2O-, 0.16; H_2O+, 1.10; TiO_2, 4.84; MnO, 0.10; sum 99.75; Sp. Gr. 3.39.

The augite is black, and fine-grained, containing abundant minute rod-like black inclusions, believed to be ilmenite, arranged in two distinct series, parallel to the vertical axis, and to the edge 001-010. The mineral exhibits striking optical properties and is compared with one from Rio de Janeiro, which it nearest approaches.

S. G. G.

LEVERRIERITE FROM COLORADO. ESPER S. LARSEN, U. S. Geol. Survey, and EDGAR T. WHERRY, U. S. Nat. Museum. *J. Wash. Acad. Sci.* **7**, (8), 208-217, 1917.

Leverrierite occurs in the veins of quartz and manganese oxides at Beidell, Saguache County, Colo., in cleavage plates up to several inches across. It has a very perfect basal cleavage. It becomes plastic when wet. Optically—; practically uniaxial, the optic axis emerging sensibly normal to the cleavage $\alpha = 1.558$, β and $\gamma = 1.602$. A chemical analysis of the mineral by E. T. W. is given, and the loss of H_2O at different temperatures. This analysis and analyses of rectorite, leverrierite, batchelorite, kryptotile, and delanouite are compared, and show some variation in the water content and more especially in the SiO_2:Al_2O_3 ratio, which varies from 1.86 in batchelorite to 3.95 in delanouite. However, optical study of the six minerals indicates that they belong to a single group, probably related to the micas. Analyses of muscovite show almost as wide a range in the SiO_2:Al_2O_3 ratio. The formula of the leverrierite group may be written $Al_2O_3.2\pm SiO_2.2\frac{1}{2}\pm H_2O$.

S. G. G.

THE CONSTITUTION OF MELILITE AND GEHLENITE. F. W. CLARKE, U. S. Geol. Survey. *Am. J. Sci.*, [4], **43**, (6), 476–484, 1917.

A study of the analyses of melilite and gehlenite with a discussion of their empirical and structural formulas. S. G. G.

RADIOACTIVE MINERALS IN SOUTH AFRICA. P. D. HAHN. *S. African J. Sci.* **12**, 494–452, 1916. Abstract by W. H. Ross, reprinted by permission from *Chem. Abstr.*, **11**, (1), 11, 1917.

The following 6 South African minerals have been observed to be radioactive: monazite, aeschynite, euxenite, fergusonite, carnotite with uranium ocher, and pitchblende. In none of the minerals analyzed were U and Th found together.

EXCHANGE NOTICES.

Edgar T. Wherry, U. S. National Museum, Washington, D. C. Wanted, specimens of the following native element minerals (small fragments will answer). seleniferous tellurium ("selentellurium"); telluriferous sulfur ("tellursulfur"); monoclinic sulfur; selenium; monoclinic arsenic ("arsenolamprite"); amorphous sulfur; and amorphous selenium on lava.

Good study specimens of almost any minerals except the most excessively rare ones can be sent in exchange.